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TOROIDAL CHOKE INDUCTOR FOR WIRELESS
COMMUNICATION AND CONTROL

ABSTRACT OF THE DISCLOSURE

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An induction choke in a petroleum well where a voltage potential is developed across the choke to power and communicate with devices and sensors in the well. Preferably, the induction choke is a ferromagnetic material and acts as an impedance to a time-varying current, e.g. AC. The petroleum well includes a cased wellbore having a tubing string positioned within and longitudinally extending within the casing. A controllable gas lift valve, sensor, or other device is coupled to the tubing. The valve sensor, or other device is powered and controlled from the surface. Communication signals and power are sent from the surface using the tubing, casing, or liner as the conductor with a casing or earth ground. For example, AC current is directed down a casing or tubing or a lateral where the current encounters a choke. The voltage potential developed across the choke is used to power electronic devices and sensors near the choke. Such induction chokes may be used in many other applications having an elongated conductor such as a pipe, where it is desirable to power or communicate with a valve, sensor, or other device without providing a dedicated power or communications cable.

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